

CLAIMS

1. (Currently Amended) A three-dimensional molding apparatus for forming a three-dimensional molded article by binding a powder material, said apparatus comprising:

(a) a layer formation device for sequentially forming a layer of a powder material;

(b) a binder applying device for applying a binder which will harden in response to certain energy to a selected region in said layer of the powder material; and

(c) an energy supply device for supplying said certain energy to said binder applied to said powder material,

wherein a bound body of said powder material is formed by said binder to harden in response to said certain energy supplied from said energy supply device, said energy supply device and said binder applying device are integrally configured, and said binder applying device applies binder during a primary scanning in a first direction while said energy supplying device supplies said certain energy during a secondary scanning in a second direction, reverse said first direction.

2. (Cancelled).

3. (Previously Presented) A three-dimensional molding apparatus for forming a three-dimensional molded article by binding a powder material, said apparatus

comprising:

- (a) a layer formation device for sequentially forming a layer of a powder material;
  - (b) a binder applying device for applying a binder which will harden in response to certain energy to a selected region in said layer of the powder material;
  - (c) an energy supply device for supplying said certain energy to said binder applied to said powder material; and
  - (d) a coloring device for supplying a coloring carrier to a region to be colored in said bound body after said bound body of the powder material is formed,
- wherein a bound body of said powder material is formed by said binder to harden in response to said certain energy supplied from said energy supply device.

4. (Original) The three-dimensional molding apparatus according to claim 3, wherein said coloring device has a plurality of nozzles for discharging coloring carries of different colors, respectively.

5. (Original) The three-dimensional molding apparatus according to claim 3, wherein said region to be colored is in the vicinity of a surface of said three-dimensional molded article.

6. (Original) The three-dimensional molding apparatus according to claim 1, wherein said binder will harden in response to light energy of a predetermined

wavelength.

7. (Original) The three-dimensional molding apparatus according to claim 1, wherein said binder will harden in response to heat energy.

8. (Original) The three-dimensional molding apparatus according to claim 1, wherein said layer formation device includes a feeder for feeding plural kinds of powder materials.

9. (Original) The three-dimensional molding apparatus according to claim 8, wherein said energy supply device can selectively feed said plural kinds of powder materials to a plurality of regions for each layer of said powder material.

10. (Original) The three-dimensional molding apparatus according to claim 1, wherein said binder applying device discharges said binder by means of a piezo-electric device and supplies said binder to said selected region.

11. (Currently Amended) The three-dimensional molding apparatus according to claim [[2]] 1, wherein said bound body related to said layer of the powder material is formed by activating said binder applying device and said energy supply device in ~~synchronous~~ synchronism with activation of said layer formation device.

12. (Previously Presented) A three-dimensional molding apparatus for forming a three-dimensional molded article by binding a powder material, said apparatus comprising:

- (a) a layer formation device for sequentially forming a layer of a powder material;
- (b) a binder applying device for applying a binder which will harden in response to certain energy to a selected region in said layer of the powder material; and
- (c) an energy supply device for supplying said certain energy to said binder applied to said powder material; wherein

a bound body of said powder material is formed by said binder to harden in response to said certain energy supplied from said energy supply device,

said energy supply device supplies said certain energy to each layer of said powder material which is formed sequentially,

said bound body related to said layer of the powder material is formed by activating said binder applying device and said energy supply device in synchronous with activation of said layer formation device, and

said binder applying device is disposed between said layer formation device and said energy supply device.

13. (Currently Amended) The three-dimensional molding apparatus according to claim [[2]] 1, wherein the bound body related to said layer of the powder material is formed by activating said binder applying device and said energy supply device after said

layer of powder material has been formed by activating said layer formation device.

14. (Previously Presented) A three-dimensional molding apparatus for forming a three-dimensional molded article by binding a powder material, said apparatus comprising:

(a) a layer formation device for sequentially forming a layer of a powder material;

(b) a binder applying device for applying a binder which will harden in response to certain energy to a selected region in said layer of the powder material; and

(c) an energy supply device for supplying said certain energy to said binder applied to said powder material; and

a holding device for holding said layer formation device and said binder applying device and said energy supply device in integrated manner, wherein

a bound body of said powder material is formed by said binder to harden in response to said certain energy supplied from said energy supply device,

said energy supply device supplies said certain energy to each layer of said powder material which is formed sequentially,

the bound body related to said layer of the powder material is formed by activating said binder applying device and said energy supply device after said layer of powder material has been formed by activating said layer formation device, and

in said holding device, said energy supply device is disposed between said layer formation device and said binder applying device.

15. (Previously Presented) A three-dimensional molding apparatus for forming a three-dimensional molded article by binding a powder material, said apparatus comprising:

(a) a layer formation device for sequentially forming a layer of a powder material;

(b) a binder applying device for applying a binder which will harden in response to certain energy to a selected region in said layer of the powder material; and

(c) an energy supply device for supplying said certain energy to said binder applied to said powder material; and

a holding device for holding said layer formation device and said binder applying device and said energy supply device in integrated manner, wherein

a bound body of said powder material is formed by said binder to harden in response to said certain energy supplied from said energy supply device,

said energy supply device supplies said certain energy to each layer of said powder material which is formed sequentially,

the bound body related to said layer of the powder material is formed by activating said binder applying device and said energy supply device after said layer of powder material has been formed by activating said layer formation device, and

in said holding device, said binder applying device is disposed between said energy supply device and said layer formation device.

16. (Cancelled).

17. (Previously Presented) A three-dimensional molding apparatus for forming a three-dimensional molded article by binding a powder material, said apparatus comprising:

(a) a layer formation device for sequentially forming a layer of a powder material in a first region;

(b) a binder applying device for applying a binder which will harden in response to a certain energy to a selected region in said layer of the powder material; and

(c) an energy supply device for supplying said certain energy to a second region involving said first region at a first intensity and for supplying said certain energy to a remainder of said first region at a second intensity, less than the first intensity,

wherein a bound body of said powder material is formed by said binder to harden in response to said certain energy supplied from said energy supply device.

18. (Original) The three-dimensional molding apparatus according to claim 17, wherein said energy supply device supplies said certain energy to each layer of said powder material which is formed sequentially.

19. (Previously Presented) A three-dimensional molding apparatus for forming a three-dimensional molded article by binding a powder material, said apparatus comprising:

(a) a layer formation device for sequentially forming a layer of a powder material in a first region;

(b) a binder applying device for applying a binder which will harden in response to a certain energy to a selected region in said layer of the powder material;

(c) an energy supply device for supplying said certain energy to a second region involving said first region; and

a coloring device for supplying a coloring carrier to a region to be colored in said bound body after said bound body of the powder material is formed,

wherein a bound body of said powder material is formed by said binder to harden in response to said certain energy supplied from said energy supply device.

20. (Cancelled).

21. (Cancelled).

22. (Previously Presented) A three-dimensional molding method for forming a three-dimensional molded article by binding a powder material, the method comprising the step of:

(a) sequentially forming a layer of a powder material;

(b) applying a binder which will harden in response to a certain energy to a selected region in said layer of the powder material;

(c) supplying said certain energy to said binder applied to said powder material;



and

(d) supplying a coloring carrier to a region to be colored in said bound body after said bound body of the powder material is formed.

wherein a bound body of said powder material is formed by said binder to harden in response to said certain energy supplied from said energy supply device.

23. (Previously Presented) A three-dimensional molding method for forming a three-dimensional molded article by binding a powder material, comprising the steps of:

- (a) sequentially forming a layer of a powder material in a first region;
- (b) applying a binder which will harden in response to a certain energy to a selected region in said layer of the powder material; and
- (c) supplying said certain energy to a second region involving said first region at a first intensity while supplying said certain energy to a remainder of said first region at a second intensity, less than the first intensity,

wherein a bound body of said powder material is formed by said binder to harden in response to said certain energy supplied from said energy supply device at said first intensity.